

A BROOD OF YOUNG FLICKERS (*COLAPTES AURATUS*) AND HOW THEY WERE FED.

BY WILLIAM BREWSTER.

LATE in May, 1892, I noticed a Flicker's hole, then apparently completed, in a very rotten stump covered externally with gray lichens and a species of woody fungus. This stump was one of seven nearly upright but diverging stems, all evidently sprouts from the same roots and six still living. The tree, an ancient white maple, stood on the bank of Concord River, within a few yards of a boat landing. Besides the Flicker's hole the old stump contained at this time two other inhabited nests; a Downy Woodpecker's near the top, and a little lower down a Bluebird's. The Flicker's nest was still lower — about ten feet above the ground.

The Bluebirds first, and shortly afterwards the Downy Woodpeckers, reared and took away their young, after which a pair of House Sparrows entered into possession of the hole which the Downies had vacated. Scarcely had the female Sparrow laid her eggs, when a boy, attempting to climb the stump, broke it off squarely at the entrance hole of the Flicker's nest. For two weeks or more previous to this, I had frequently started one or other of the Flickers from the nest in passing it on my way to the landing; but I had learned little regarding them beyond the fact that their hearing was so keen that I could never quite reach the tree without alarming them, and that during this period (when, as will presently appear, incubation must have been constantly going on) they were frequently at work pecking at the inside of the trunk.

The accident to the stump happened June 23, at about noon. An hour later I examined the nest, which was now entirely open at the top. In the bottom lay five young Flickers, about as large as plucked House Sparrows and perfectly naked. Their eyes were tightly closed and I judged them to be less than a week old. They were writhing and shivering pitifully, the air being cool and damp at the time. I watched the nest for nearly an hour, but saw nothing of the parent birds. As a cold rain storm began soon after and lasted through the following night I con-

cluded that the young Flickers would speedily die, but on the morning of July 1, when I next visited the nest, all five proved to be alive and vigorous. They had more than doubled in size, and were well feathered on the head and body, while their quills and tail feathers were sprouting and their eyes were wide open.

I now noticed for the first time that their upper mandibles were broadly tipped with ivory white. This so exactly resembled the hardened, spur-like process which enables young birds of most, if not all, species to chip their way out of the shell, and which they often retain for several days after hatching, that it was not until after I had taken several of the Flickers from the nest and passing my finger along the bill found its surface absolutely smooth, that I became convinced that the white tipping was merely a color marking and not an excrescence.

Another feature equally conspicuous and common to them all was a whitish gland-like swelling or process on each side of the lower mandible at its base, of about the size of the half of a small pea. All five birds already showed conspicuous black or blackish 'moustaches,' paler, however, in two individuals than in the other three.

On June 23, when the young Flickers were naked and blind, they made a low, penetrating, hissing sound whenever I shook the stump or rattled the bark on the outside. This experiment, repeated July 1, elicited an outcry so loud as to be distinctly audible thirty yards or more away from the tree, and in general effect strongly suggesting, if not also resembling, the clatter of a mowing machine. I afterwards made the direct comparison when a mowing machine was working near the tree and found the two sounds strikingly alike. This clamor, once fairly started, would be kept up for a minute or more and would then gradually die away.

I spent the greater part of July 6 and 7, and most of the afternoon of the 9th, watching this nest. During these three days I saw only the male parent. Probably the female had been killed before my vigils began, although once when the male was calling near the nest, he was answered by another old Flicker, which was apparently in the same tree, but which I did not see. At first the male was very much afraid of me and would not go to the nest while I was near it, but he gradually became accustomed to

my presence, and when I concealed myself partially under a small canoe tent, he would visit the nest while I was sitting in the canoe almost directly beneath it. Thus from a distance of less than fifteen feet, I watched him feed the young. The operation was performed as follows.

The parent returning, after an absence of from eighteen or twenty to sixty minutes, would first alight in the upper part of the cluster of maples among dense foliage. If everything was quiet below he quickly and silently descended and perched on the edge of the hole, sometimes alighting there, but oftener striking against the trunk lower down and running up. If, on the contrary, he saw or heard anything to arouse his suspicions, he approached slowly and with great caution, taking short flights or scrambling backwards down one of the trunks, keeping behind it, occasionally peeping out or down at me, and frequently uttering a few notes of the usual laugh, giving them slowly and somewhat disconnectedly in a peculiar, soft, musical tone. He also uttered a call which I do not remember to have heard before, a low anxious *woi* or *wó-ā*, addressed, apparently, to the young, for they invariably and instantly answered it by a burst of their usual clamor. Occasionally the *woi* cry would be given several times in succession, and would then run directly into the laughing call.

At the first rattle of their parent's claws on the outer surface of the stump, the young appeared at the top of their burrow, and five pink-lined, wide-opened mouths clamored loudly for food. Standing on the edge of the hole, the parent selected one—usually the nearest, I thought—and bending forward and down drove his bill to its base into the gaping mouth which instantly closed tightly round it, when the head and bill of the parent were worked up and down with great rapidity for from one to one and one half seconds (timed with a stop watch), the young meanwhile never once losing its grasp, although its poor little head was jerked up and down most violently.

The first or entering downward thrust of the parent's bill was a veritable stab, the bird apparently striking with all his force and as if with the design of piercing his offspring to the vitals. The subsequent up-and-down motions were rapid, regular, and not unlike those of a Woodpecker engaged in drumming. They

also suggested the strokes of a piston. They were always accompanied by a marked, equally rapid, and apparently corresponding twitching of the tail and hinder parts of the body, and a slighter movement of the wings.

As already stated, the contact of the bills lasted from one second to a second and a half. At its termination the parent would suddenly resume an erect position and look keenly around, at the same time opening and shutting his bill, running out his tongue, and working the upper portion of the throat slightly. This action puzzled me at first. It looked as if the bird were first tasting and afterwards swallowing something which had been obtained from the mouth of the young. After watching the performance many times I came to the conclusion that it was for the purpose of regaining small particles of food which, failing to lodge in the throat of the young, had adhered to the outside of the parent's bill. On one occasion I distinctly saw the old bird, while thus tasting, drop or rub off something from the tip of the bill, and then bending forwards pick it up from the top of the stump and swallow it. The object looked like a large black ant.

If interrupted during the pumping process, as the bird occasionally was, by some motion or noise that I made, it would often feed the same young twice or even thrice in succession, but this never happened when the first period of contact was of normal length.

After resting and tasting for a moment, the parent would again bend forward and for a brief space regard the circle of gaping mouths attentively, evidently hesitating which to take next. The choice made, the operation just described would be exactly repeated. Four young were usually fed at each visit, but sometimes only three, and once but one. When the number was less than four, I think the bird took some alarm and starting off thought it not worth while to return. In no instance were more than four young fed. Whether or no the fifth was served first at the next visit, I had no means of determining.

The time which the old bird spent at the nest rarely exceeded half a minute. On leaving it he always flew straight off over the open fields to a distance of at least a quarter of a mile, beyond which I lost sight of him behind some trees. His return was

made with equal regularity, by way of an orchard which extended down to the landing from the neighboring hillside, and so stealthily that I rarely saw him until he came into the tree, and sometimes not until he appeared at the nest. His bill was always closed up to the moment of contact with that of the young first selected, and I could detect no enlargement of the throat or other evidence that his mouth contained food. In fact it was clear enough that he *swallowed* all the food obtained during these trips and afterwards supplied it to the young by a process of *regurgitation*. What this food consisted of, I can only conjecture, for I did not succeed in finding any of it in the nest or adhering to the bills of the young, and I could not bring myself to kill one of the latter and settle the point in that way.

On the morning of the 6th I found the young for the first time clinging to the walls of their cell, about midway between the bottom and the top. Later in the day, they showed their heads at the opening when the parent came to feed them, and on the 7th they spent most of their time peeping out over the rim with evident curiosity and interest, and once two climbed quite outside. When a boat appeared, or there was any sudden noise, they would all instantly and silently slip back out of sight. On the 7th and frequently afterwards I heard them tapping impatiently on the interior of the old shell.

At six o'clock of the evening of the 9th, I looked into the nest and counted all five of the young. They seemed to be fully grown and perfectly feathered. They were colored precisely alike, as far as I could see, and all had the black moustache as extensive, deeply colored and conspicuous, as in mature males of their species. The white tipping of the bill had been diminishing for several days and on this evening I noticed that two or three birds had almost wholly lost it, while in the others it was confined to the extreme end of the bill.

Four of the young had left the nest when I next visited it on the forenoon of July 10. The fifth bird was still in the hole at five o'clock that afternoon, but at three p. m. the next day I found him perched on one of the upper branches of the tree, calling *ki-u* much in the manner of an old Flicker, but in feebler tones. This cry was regularly answered by another young bird in the orchard behind, and from at least two places across the river.

Evidently the young had already become somewhat scattered. I heard them again on the following day, after which they disappeared.

The nest was left in a very foul state, the bottom being a disgusting mass of muddy excrement, alive with wriggling worms. Apparently the Flicker does not remove the excrement of its young. These young, however, managed to keep very clean, and appeared to be perfectly free from vermin.

No one, apparently, has previously observed, or at least reported, that the Flicker feeds its young by regurgitation. Nor do I find on record anything definite or satisfactory regarding the manner in which the young of the other Woodpeckers are fed before they leave the nest. This would be somewhat remarkable were it not that any attempt to pry into the family secrets of all birds that build in holes is attended with great difficulties. The difficulties can be overcome, however, by the exercise of a little patience and ingenuity, and it is to be hoped that some one who possesses these qualities, as well as the opportunities for applying them, will give the matter close attention, for it both invites and demands thorough investigation.

ON THE OCCURRENCE OF CERTAIN BIRDS IN BRITISH COLUMBIA.

BY WILLIAM BREWSTER.

AMONG some birds taken in British Columbia by Mr. Allan C. Brooks, and now in my collection, are the following, several of which do not appear to have been previously reported from the Province just named.

1. *Falco sparverius deserticolus*. DESERT SPARROW HAWK.—Three specimens, a male and two females, all taken at Chilliwack.
2. *Picoides americanus alascensis*. ALASKAN THREE-TOED WOODPECKER.—A female Three-toed Woodpecker, labelled as having been obtained on the "Summit of the Cascade Mountains, 8 miles north of Mt. Baker," September 8, 1891, agrees so perfectly with descriptions of